U.S. Fish & Wildlife Service – Pacific Region

Abernathy Fish Technology Center Newsletter

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In this Issue:

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John Holmes, Fish Biologist
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Jim Lowell, Maintenance Worker

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Ron Twibell, Fish Nutritionist
Nathan Hyde, Biological Technician
James Barron, Biologist

Conservation Genetics:
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Christian Smith, Conservation Geneticist
Pat DeHaan, Conservation Geneticist
Brice Adams, Biological Technician
Matt Smith, Fish Geneticist
Jennifer Von Bargen, Lab Geneticist
Dan Bingham, Fish Geneticist

Ecological Physiology:
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Kyle Hanson, Fish Physiologist
Ben Kennedy, Fish Ecologist
Richard Glenn, Microbiologist
Will Simpson, Fish Ecologist
Kurt Steinke, Electronics Engineer

Modeling and Management Decision Support:
Doug Peterson, Senior Scientist

AFTC and Archery

Scott Gronbach demonstrating the proper use of a bow and arrow. *USFWS*

The U.S. Fish and Wildlife Service strives to reach out to families by engaging today's youth in fun educational and outside activities. Partnering with State agencies, Tribal governments and community members, the Service participates in many outdoor events that reach out to youth, sharing our passion for the great outdoors and its recreational opportunities. This spring, more than 4,000 children and their families participated in the Klineline Kids Fishing Derby in Vancouver, WA.

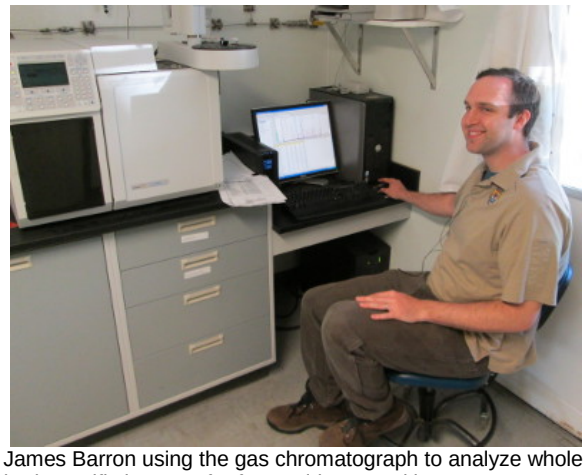
Our partners at the Washington Department of Fish and Wildlife took extra care in stocking Klineline Pond with more than 10,000 rainbow trout for Clark County's largest annual fishing event. Klineline Pond offered the perfect environment for this event, attracting community sponsors and vendors who enhanced the weekend's festivities with free ice cream, bird house building, face painting and even archery. AFTC staff have volunteered at this event for the past two years. This year, Scott Gronbach provided his expertise in the archery skills event. He looks forward to volunteering for the event again next year. (Jane Chorazy of the RO contributed to this article).

Program Highlights….

Nutrition

The Nutrition Program analyzed 23 feed samples for Fish Feed Quality Control in March and April. As part of the routine analyses, all feeds from the hatcheries were checked for rancidity. Ann Gannam wrote the feed memos and then contacted the feed mills when necessary. In addition, five feeds used at AFTC were analyzed for proximate composition.

Data collection continues for the Pacific lamprey diet trial. Whole body lamprey are being analyzed for total lipid and fatty acids to determine the diets' impact on the fish's body composition.



James Barron using the gas chromatograph to analyze whole body Pacific lamprey for fatty acid composition.
USFWS: R. Twibell

The Nutrition Program has been contacted by Makah, Quilcene, Carson, Warm Springs and Hagerman NFHs for assistance with feed related trials. Warm Springs and Makah NFHs are interested in using the transfer diet (salt added). Carson, Warm Springs and Quilcene NFHs want to look at altered feeding programs and Hagerman NFH wants to run a diet comparison trial.

Nutrition cont….

In the way of feed assistance, we top-coated feed with fish oil for Little White Salmon NFH for their feeding trial using a low lipid feed for the endangered White River Chinook salmon. We are also in communication with Scott Foott at the Pacific Southwest Region's Fish Health Center concerning possible diet solutions for the endangered Lost River and shortnose suckers.

Ron Twibell topcoating feed for Little White Salmon NFH. USFWS: J. Barron

Kaitlyn Fielding, a student at Portland State University, volunteered with the Nutrition Program for two days. She assisted in the laboratory with feed and fish analyses and helped stock fish for a feeding trial.

Conservation Genetics

Jennifer Von Bargen and Christian Smith started the ninth year of rapid response genetic identification of potential winter-run Chinook salmon (WRCS) broodstock with 143 samples. Winter-run Chinook salmon were listed as "endangered" in 1994 (59 Federal Register 440). (Continued page 3)

Program Highlights cont….

Conservation Genetics cont….

In 1989, the service began propagating WRCS to supplement natural production. The supplementation program was initially located at the Coleman NFH on Battle Creek, a tributary of the Sacramento River, CA. In 1998, the program was moved to the newly constructed Livingston Stone NFH located at the base of Shasta Dam to increase returns to the mainstem Sacramento River. WRCS migrate into the upper reaches of the Sacramento River, hold in cool waters released from Shasta Dam, and spawn from May through August between the city of Red Bluff (river mile [RM] 245) and Keswick Dam (RM 302), the upstream limit of migration.

Brice Adams and Dan Bingham started work on a project designed to determine whether we can answer questions about fitness of hatchery and wild coho salmon spawning in Abernathy Creek using adult to adult parentage assignments. The initial phase of this project, in cooperation with Ben Kennedy and John Holmes, uses samples collected from adult coho which return to spawn annually in Abernathy Creek to assess our ability to assign parentage to three year old returning adult offspring.

A total of 2,910 samples of redband trout collected by our partners from throughout the Great Basin of OR were genotyped and scored by Jennifer Von Bargen and Pat DeHaan. Ninety-eight percent of the samples were successfully genotyped at 92-96 SNP markers which were previously selected by Pat for their usefulness in assessing the genetic relationships among these populations. This project is funded through the Western Native Trout Initiative (WNTI).

Conservation Genetics cont….

Jennifer Von Bargen continued testing of a sex-identification SNP (single nucleotide polymorphism, Ots_SexID_GHpsi-348) marker that she developed by comparing phenotypic sex and genetically determined sex in over 29 populations of Chinook salmon collected from throughout the range of the species as part of the GAPS (Genetic Analysis of Pacific Salmon) project. Results are promising, stay tuned for the final assessment!

Global Construction Group was onsite completing requisite repairs to the new genetics flammable storage building. Through their repairs and Scott Gronbach's continuous COR fretting, the Program has finally moved into their one-of-a-kind fin clip storage facility. Program and Facilities staff assembled shelves and moved genetic samples into the new facility. The new building provides secure, well organized storage for 155,000 valuable tissue samples from a variety of species.

Conservation Genetics staff moving the boxes of genetic samples to the new storage building. *USFWS*

Program Highlights cont….

Conservation Genetics cont….

Matt Smith and Dan Bingham collected tissue samples from steelhead with Oregon Department of Fish and Wildlife (ODFW) biologist Derrek Faber. The Bonneville Power Administration (BPA) funded project is using pedigree reconstruction to determine the relative reproductive success of stray hatchery and wild steelhead spawning in two Deschutes River tributaries.

Smolt trap on Bakeoven Creek in the Deschutes River Basin, OR, June 2012.
USFWS: M. Smith

Jennifer Von Bargen and Dan Bingham have been working to genotype samples from the founding broodstock for the BPA funded Abernathy Creek steelhead program. These fish were collected as juveniles from Abernathy Creek, reared at the hatchery until maturity, and then spawned to generate the first smolts released from the program. The founding broodstock will be included in an analysis of the relative differences between the smolts produced in the hatchery and the smolts produced naturally in Abernathy Creek.

Ecological Physiology

Kyle Hanson and Ann Gannam discussed a research proposal to evaluate the effects of salt supplemented diets on the smoltification and condition of juvenile Chinook salmon with Roger Sorensen and Jarrett Page at Makah NFH. Kyle Hanson collected gill biopsies from juvenile Chinook salmon at Makah NFH as part of a study to evaluate the effects of salt supplemented diets on migration success of hatchery salmon.

Richard Glenn and Kyle Hanson collected gill biopsies from juvenile steelhead rearing at AFTC. Fish will be sampled monthly until release in late April and early May.

The Program held a retreat at the Monticello Hotel in Longview, WA. We discussed program goals and potential external funding avenues.

Will Simpson and Kurt Steinke completed a new antenna installation and are working on system communications troubleshooting/technology issues for a Bureau of Reclamation (BOR) funded project that examines entrainment of salmonids with a series of passive integrated transponder (PIT) tag array systems at water diversion canals and fish bypass structures near Hermiston, OR.

Will Simpson and Kurt Steinke successfully deployed a system developed at AFTC to remotely operate PIT tag antenna arrays. AFTC uses these antenna arrays to estimate entrainment and survival of ESA-listed juvenile steelhead diverted into irrigation canals on the Umatilla River in northeast OR.

Program Highlights cont….

Ecological Physiology cont….

The Program put together a small PIT system consisting of three antennas and a multiplexer (on loan) for the Coleman NFH and Redbluff FWO office to detect out-migrating steelhead kelts from a holding pond at the hatchery.

Program staff installed PIT tag antenna arrays on Abernathy Creek adjacent to AFTC and at Abernathy Creek's confluence with the Columbia River. The antenna arrays are used to determine migrational timing and demographics of Abernathy Creek steelhead smolts.

Kurt Steinke prepared a design, materials list, and assembly instructions to build two DC/DC converters to step down the voltage from a 24V solar array to 12V and 18V to power HDX readers for monitoring bull trout at Clear Lake, WA. Off the shelf power supplies have switching frequencies near the data rate at which PIT tags communicate, and interfere with reading tags.

Kurt Steinke prepared a design and materials list for DC/DC converters to power laptop computers which interface to a full duplex PIT tag system for monitoring lake sturgeon at White Rapids near Green Bay, WI. The power supplies provided with the laptops have switching frequencies near the data rate at which PIT tags communicate, and interfere with reading tags.

Ecological Physiology cont….

Kurt Steinke visited Maggie Creek near Elko, NV, to troubleshoot three half duplex PIT tag systems for Trout Unlimited and the Nevada Department of Wildlife to monitor passage of Lahontan cutthroat trout.

Kurt Steinke designed and built antennas for a PIT tag system at Coleman NFH to monitor the release of their steelhead kelts. The system consisted of three antennas (to provide redundancy and a high recognition rate) designed for temporary use.

Modeling and Management Decision Support

Doug Peterson met with stakeholders from the Avista Corporation and the Mountain Prairie Region to plan an upcoming workshop to evaluate Avista's Native Salmonid Restoration Plan for the lower Clark Fork River.

Doug Peterson gave a webinar presentation to attendees of the US Forest Service Region 1 annual Soil, Water, and Fish program meeting. The title of the presentation was "Persistence of westslope cutthroat trout in stream fragments isolated by culverts".

Victoria O'Byrne continued working on a major project to analyze historic changes in riparian vegetation in two watersheds in southwestern MT. The data she generates will be used to analyze whether changes in willow density correlates with trends in the genetic population status of Arctic grayling in the Big Hole River and Red Rock lakes.

Program Highlights cont….

Modeling and Management Decision Support cont….

Victoria O'Byrne visited the RO to attend the Pacific Region's monthly Geographic Information System (GIS) meeting. While she was there she also digitized historical aerial photos for a land cover analysis.

Doug Peterson was co-author on a study recently highlighted by Today @ Colorado State (http://www.today.colostate.edu/story.aspx?id=8547. The study examined threats to Colorado River cutthroat trout and developed a decision support model to predict the persistence of isolated populations under future climate conditions.

Administration/Facilities

Judy Gordon participated in the Pacific Region's Information Management Summit at the RO. The objective was to improve the Pacific Region's ability to support conservation decision making. The goal of the summit was to develop a focused set of priority action items to address key information barriers and challenges, such as addressing issues associated with data infrastructure, access, protocols and standards, longevity, e.g., as well as actions to facilitate cross-program data management, coordination, and how the Pacific Region communicates internally about existing data and access to that data.

Mid-year's reviews were completed for the entire staff.

Patty Crandell worked with Bill Gale from the Mid-Columbia River FRO on finalizing the Winthrop NFH Climate Change Vulnerability Assessment Report.

Administration/Facilities cont….

Patty Crandell met with Jana Grote at the RO to discuss a variety of topics including the opportunity to hold a training meeting for Fisheries Resources staff.

John Holmes and Patty Crandell met with Caroline Peterschmidt at Eagle Creek NFH to gain an understanding of the steelhead early rearing protocols at the NFH. John and Patty are developing projects to better understand the impact of treating steelhead eggs with formalin.

Juvenile releases for the project occured on April 18th with 3,500 yearling steelhead (smolts) and April 30th with 3,300 smolts. The last release will occur in May.

Winter steelhead adult returns are being trapped through May for the BPA funded project "Natural Reproductive Success and Demographic Effects of Hatchery-Origin Steelhead in Abernathy Creek, WA". Totals at the end of April were 12 natural-origin (9 released upstream, 3 retained for broodstock), 26 hatchery-origin (4 released upstream, 22 retained for broodstock) and 22 stray "out of basin" hatchery-origin steelhead (euthanized).

Shawn Swartout has been hired as a Biological Science Aide in a training position using the Veteran's Recruitment Authority. Shawn is currently on a detail at Willard NFH where he is getting the opportunity to learn about rearing several species of salmon. Information about Shawn will be in the next newsletter.

Administration/Facilities cont….

Over the past two months, Facilities has begun their spring cleaning festivities including updating operating procedures, safety documentation and performing annual preventive maintenance on a slew of equipment. Examples include, Jim Lowell completed the annual maintenance to the John Deere backhoe, the two golf carts, and the lawn mower. The septic system also received its annual check-up which brought to light a potential cave-in concern that AFTC will need to address in the coming year. AFTC's 60 fire extinguishers, more than 2 dozen fire system devices and the residence fire sprinkler system received their annual inspection and testing

Jim Lowell completed the demolition of the temperature control building and has nearly completed the demolition of the bio-filter compressor and pump house buildings. Once completed, a new electrical housing building will be constructed and the remaining portions of the abandoned bio-filter outbuildings will be leveled.

Jim Lowell determining the next step of the demolition of the bio-filter compressor project. *USFWS: T. Scholder*

Administration/Facilities cont….

When not completing preventive maintenance or project deliverables, Facilities took aim at several problem spots in the water system infrastructure. Noteworthy efforts included Jeff Poole replacing a faulty aeration tower flow meter and identifying several valves requiring replacement or reconditioning in CY13. He has also continued the herculean responsibility of documenting the domestic water system by eliciting assistance from Pacific Region engineer Mark Harris and the Washington Department of Health (DOH). From his efforts, AFTC intends to become 100% compliant with the WA DOH documentation requirements in CY13.

Safety events over the past 2 months include the performance of a fire drill and the completion of AFTC's annual safety self-audits/checklists.

Scott Gronbach visited Little White Salmon NFH as the COTR to document the pavement activities that Five Rivers conducted per the spawning building enhancement project. As expected, the asphalt looks great and is ready for the spawning activities to begin this month.

Meetings and Training….

Nutrition:

- Ann Gannam and Kyle Hanson (Ecological Physiology) participated in a conference call with Larry Zeigenfuss from Carson NFH to develop a study plan focused on the effects of diet and growth patterns on precocial maturation in juvenile Chinook salmon.
- Ann Gannam called in to the Warm Springs NFH Hatchery Evaluation Team (HET) meeting.
- Ann Gannam, Christian Smith, and Denise Hawkins attended the Quilcene NFH HET in Lacey, WA.

Conservation Genetics:

- The AFTC Abernathy Creek steelhead project workgroup met to discuss plans for the current spawning year and to work on combining the results from the individual objectives. The overall goal of this BPA funded project is to determine the natural reproductive success and mean relative fitness of hatchery-origin and natural-origin steelhead in Abernathy Creek, WA, and to assess the overall demographic effects of hatchery fish supplementation in Abernathy Creek relative to two adjacent control streams, Germany and Mill creeks. The long-term contribution of stocked fish to recruitment and harvest of steelhead populations is unknown. Because stocking is only one of several management options for this species, it is critical to learn additional information on the effect of rearing technique, size and physiological status of stocked fish, and genetic contribution to optimize use of hatchery produced fish while simultaneously conserving wild stocks.
- Denise Hawkins participated in the HET meetings for Quinault NFH with Kyle Hanson and Judy Gordon and the Makah NFH HET. Ann Gannam called into the Makah NFH HET meeting.
- Dan Bingham met with Mike Hudson and Tim Whitesel, Columbia River FPO to discuss the results of a microsatellite analysis of bull trout in the Imnaha River subbasin.
- Pat DeHaan, Brice Adams, and Denise Hawkins joined Maureen Small, Washington Department of Fish and Wildlife (WDFW) to meet with service staff from the Washington FWO and Central WA Field Office, and other partners to discuss bull trout genetics in the Upper Columbia and Yakima rivers.
- Pat DeHaan, Brice Adams, and Denise Hawkins met with Roger Tabor, Washington FWO, to work on an Olympic mudminnow manuscript.

Administration/Facilities:

- Judy Gordon, Scott Gronbach and Jim Lowell participated in meetings with the Pacific Region's Division of Engineering and Contracting and General Services as they work to implement new processes for project management. They are using a rehabilitation of residence #2 as a model for this new process.
- Judy Gordon hosted an on-site meeting with Brad Senatra, Division of Engineering and the design firm MWH to discuss potential designs for a replacement of the AFTC's electric weir.
- Patty Crandell attended two Regional Climate Board meetings, one by phone and one in the RO.
- Ann Gannam and Patty Crandell attended the Columbia River Gorge NFHC HET meeting. Many interesting research related topics were discussed such as: possible residualizing or delayed fish after releases, a possible problem with the creation of mini jack or precocious salmon and methods for solving the problem, and the advantages of holding off on first feeding. Staff from all of the Gorge NFHs and the Columbia River FPO participated.

Meetings and Training….

Administration/Facilities cont:

- Patty Crandell participated in a Pacific Region Fisheries Resources Program call where she discussed a survey for NFH project leaders to collect information about how water flows and temperatures are collected at NFHs.

- Patty Crandell and Denise Hawkins participated in a FTC Community of Practice conference call. Agenda items included: Asian Carp Surveillance Team update, FTC outreach document, FTC Evaluation, HQ Reorganization, and use of ServCat.

- Patty Crandell participated in a 3 day Crucial Conversations training.

- The Climate Change Vulnerability Assessment Team including Patty Crandell, Kyle Hanson, Doug Peterson, Bill Gale (Mid-Columbia River FRO), and Don Campton (RO) met with Denise Hawkins, the Olympic Peninsula NFH managers, Olympia FHC staff, and Washington FWO Fisheries staff about NFH vulnerability assessments.

- A quarterly safety committee meeting was held in April along with monthly training topics ranging from electric weir safety to lyme disease awareness.

- Jeff Poole attended a water distribution system course held by the Pacific Northwest Section of American Waterworks Association (PNWS-AWWA) - Lower Columbia Subsection on pump maintenance.

- Scott Gronbach and Jim Lowell attended two meetings with Pacific Region contracting officers, engineers, and fisheries program leadership intending to document the true scope of work needed to complete a construction project within Pacific Region domain. The restoration of the AFTC nutrition office and conference room has been identified as the focus point for this and future project management meetings slated to continue throughout FY13.

- Patty Crandell, Mark Ahrens (Spring Creek NFH), and Rod Engle (Columbia River FPO) met with Mike Carrier to discuss renewing the Hatchery Management Workshop. Although the Workshop has always included a training component, the newly designed annual meeting will provide training focused on the needs of the NFH system (FROs, NFHs, FHCs, and FTC). Mike has given permission to hold Hatchery Management Training from November 13-15, 2013.

Reports and Publications….

Conservation Genetics:

Moran, P., Teel, D.J., Banks, M.A., Beacham, T.D., Bellinger, M.R., Blankenship, S.M., Candy, J.R., Garza, J.C., Hess, J.E., Narum, S.R., Seeb, L.W., Templin, W.D., Wallace, C.G., and Smith, C.T. 2013. Divergent life-history races do not represent Chinook salmon coast-wide: the importance of scale in Quaternary biogeography. Canadian Journal of Fisheries and Aquatic Sciences 70: 415-435.

Adams, B., Tabor, R., Thompson, B., DeHaan, P.W., and Hawkins, D.K. 2013. Characterization of tetranucleotide microsatellite loci for Olympic mudminnow (*Novumbra hubbsi)*. Conservation Genetics Resources 5: 573-575.

Smith, M. J., D. Hawkins, D. M. Faber, and W. H. Wilson. 2013. Investigation of the relative reproductive success of hatchery and wild steelhead in the Deschutes River Basin. AFTC Final Report FY2012:49.

Ecological Physiology:

Cooke, S.J., M.R. Donaldson, C.M. O'Connor, G.D. Raby, R. Arlinghaus, A.J. Danylchuk, K.C. Hanson, S.G. Hinch, T.D. Clark, D.A. Patterson, and C.D, Suski. 2013. The physiological consequences of catch-and-release angling: Perspectives on experimental design, interpretation, extrapolation, and relevance to stakeholders. Fisheries Management and Ecology. 20:268-287.

Compton, M. and C.M. Taylor C. 2013. Spatial scale effects on habitat associations of the Ashy Darter, *Etheostoma cinereum*, an imperiled fish in the southeast United States. Ecology of Freshwater Fish. 22:178-191.

Miyazono, S. and C.M. Taylor. 2013. Effects of habitat size and isolation on species immigration-extinction dynamics and community nestedness in a desert river system. Freshwater Biology DOI: 10.1111/fwb.12127.

Modeling and Management Decision Support:

Douglas P. Peterson, Seth J. Wenger, Bruce E. Rieman, Daniel J. Isaak 2013. Linking Climate Change and Fish Conservation Efforts Using Spatially Explicit Decision Support Tools. Fisheries 38(3):112-127. DOI: 10.1080/03632415.2013.769157.

AFTC Women are Everywhere!

Vignettes about the women of AFTC have been popping up all over the web. Here are a few of the links to places where you may read about how they became interested in science and conservation.

Sharing Our Stories: The Women of Region One
https://intranet.fws.gov/region1/aba/adminupdates/aadocs/SharingOurStories.pdf

Blogs

Open Spaces Blog
http://www.fws.gov/news/blog/index.cfm/2013/3/7/Careers-in-Conservation-DNA-and-Inspiration-from-Above

Faces of Nature Blog (Pacific Region)
http://facesofnatureusfws.blogspot.com/2013_02_01_archive.html

Facebook

US Fish and Wildlife Service
https://www.facebook.com/usfws/app_4949752878?viewas=0

US Fish and Wildlife Service: Jobs
https://www.facebook.com/USFWSJobs

US Fish and Wildlife Service: Fisheries
https://www.facebook.com/USFWS.Fisheries?group_id=0

Tumbler
http://99fulan.appspot.com/usfwspacific.tumblr.com/

Outreach….

Richard Glenn describing the anatomy of a fish.
USFWS: T. Scholder

Future Scientists

The Webelos Den from Cub Scout Pack 319 came out during spring break to see the Ecological Physiology Program's laboratory and earn their scientist badge. They were shown how PIT tags are used, microscope uses, a fish dissection, and they took bacterial samples from various locations to observe bacterial growth on petri dishes.

Earth Day

Ann Gannam set up and manned a booth for Earth Day, celebrated in Longview, WA. Over 150 kids plus their parents visit the booth, many with questions and comments. Children were excited to try to identify Pacific salmon by matching the fish's picture to its description.

Visitors at Earth Day identifying Pacific salmon.
USFWS: A. Gannam

Brice Adams and Nathan Hyde at Kessler Career Day.
A. Warner

Career Day

Nathan Hyde and Brice Adams presented information about AFTC and Pacific salmon to grade schoolers at Kessler Grade School for their Career Day.

Mt. Hood College

Mt. Hood Community College's Fish Technology Program students paid their annual visit. Judy Gordon provided a tour of the facility and joined various staff in answering questions from 17 students.

Judy Gordon giving an overview of AFTC to the students.
USFWS: T. Scholder